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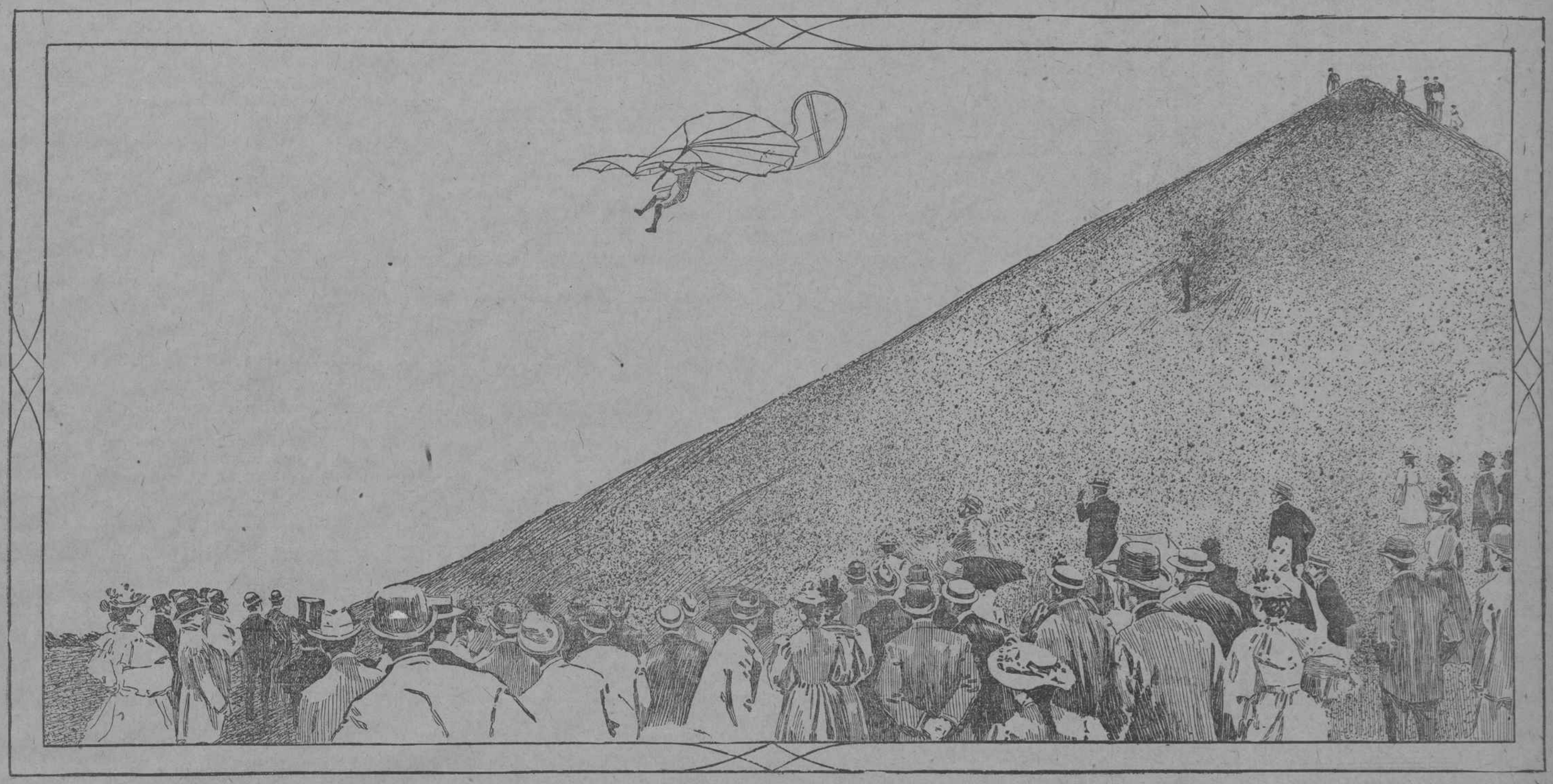
A FLYING MACHINE AT LAST THAT REALLY FLIES



A Journal Reporter Succeeds in Flying with One of Inventor Lilienthal's New Flying Machines.

FLYING as a sport has been tried by the Journal and found to be a success. Athletics in the air, it has been demonstrated by careful experiments, are as practicable as athletics on the ground.

There is no reason why there can't be 100, 200, or even 300 yard dashes, far above the heads of spectators at Berkeley Oval this Summer. Fleetness of wing should hereafter cut quite as important a figure in the world of sport as fleetness of foot.

Otto Lilienthal, of Berlin, who has acquired an international reputation as the "flying man," is the inventor and maker of about the only flying machine in the world that flies. After years of careful research he perfected a soaring apparatus, constructed upon the principle of a bird's wing. It will carry a man of average weight short distances, provided a start is made from some elevation, the higher the better, and provided also the soaring is against the wind.

But this is as far as Lilienthal has got He has not been able to build a machine that will sail great distances or in every direction. He is far from supposing that his wings, although they afford the means of sailing and even of soaring in the air, possess all the delicate and subtle qualities necessary to the perfection of the art of flight. He is satisfied, however, that his researches show that it is worth while to prosecute the investigations further.

ATHLETES APPEALED TO.

With this idea in view he called upon the athletes of the world to help him. He suggested that his machine already flies well enough to test the skill and endurance of the man who operates it, and that it presented a great opportunity in athletic sports. If he could secure, he said, its general adoption for such purposes, he would be able to go on and realize its utmost possibilities. He pointed out, too, that there was nothing more fascinating than flying, while it offered infinitely more opportunities for skillful manœuvring than the bicycle.

Lilienthal is not after money. He seeks power, not profits. He only wants to have his studies of the mysteries of aerial navigation supplemented by others.

The Journal, acting upon Lilienthal's suggestion, determined to test the machine and discover if the claims of the inventor were well founded, so an order was given the German for a pair of his wings.

The apparatus was constructed according to the inventor's latest model, and it arrived in this country a week ago. It covered the distance between Berlin and New York without sustaining a scratch. It resembles a gigantic sea gull. Open a mammoth umbrella and cut it squarely in half and you will have a fairly good representation of one of the flyer's wings. It is made almost entirely of closely woven muslin, washed with collodion to render it impervious to air, and stretched upon a rib fram of split willow, which has been found to be the lightest and strongest material for this purpose. Its main elements are the arched wings.

THE POINTS OF CONSTRUCTION.

The wing of a bird is divided into three parts, corresponding to the shoulder joint, the forearm and the hand and fingers of the human frame. The two former, composed largely of bones, muscles and tendons, are comparatively heavy, and their rapid movement demand the expenditure of considerable physical force. The last consists almost entirely of "pin feathers" or pinions, which move to a certain extent automatically. In the larger birds—the "sailers" or "soarers"—the first two members, with their concave under surfaces, furnish the sustaining power, and the last, being at the greatest distance from the shoulder, or axis of motion, the chief propulsive force. The construction of each member is peculiarly adapted to its special purpose, and it is this which Herr Lilienthal has endeavored to imitate.

To the conviction that concave or vaulted wings were essential to success Herr Lilienthal was led not only by the examination of a great variety of natural wings, and by theoretical deduction, but by actual experiments. The means adopted for this purpose were ingenious and simple. He fitted up an apparatus in the form of the fly fan found in Park row coffee houses, with two long arms revolving horizontally, to the ends of which surfaces of different kinds and degrees of curvature could be affixed in any prequired position. The motive power was furnished by a weight and could be exactly measured. There was also an adjustment which enabled the observer to measure the lifting force of various surfaces, moving at different angles of inclination through still air.

By this means, Lilienthal was enabled to reach conclusions which were of great value to him in the construction of his fly-long machine, and the most important of them was that the most effective form of wing was that whose convexity, as measured by the versed sine of the arc, should be one-twelfth of the breadth of the wing, or of the length of the cord connecting the opposite edge.

STEERS BY A FAN-LIKE RUDDER.

Other leading features of the machine include a vertical rudder, shaped like a huge palm leaf fan, which acts as a vane in keeping the head always toward the wind, and a flat, horizontal rudder, which fits over the fan-like affair, to prevent sudden changes in the equilibrium.

Well forward between the two wings is a circular hole, through which the operator adjusts the apparatus to his arms. From tip to tip the machine measures 29 feet, and it weighs 40 pounds.

As before stated, it is always necessary to fly from some high elevation, a hill of course being safest and best. A hill ideally fitted for the experiment was found in the lawn facing the magnificent country residence of Mr. J. Harper Bonnell, and located near Garrettson, Staten Island. Mr. Boanell kindly granted permission for the use of his grounds for the experiments.

In order to fully carry out Lilienthal's suggestion an all-around athlete was chosen to operate the machine. Mr. Harry B. Bodine, of Bayonne, N. J., who has acquired more than a local reputation in many kinds of sport, and who is a member of several athletic clubs was selected. He knew as much as the average man does about aeronautics and aeroplanes, which is not very much, and absolutely nothing, of course, about manipulating a flying machine. All he had to guide him were Lilienthal's special directions, which are as follows:

First—Begin practice by running down a small hill, leaping high at times; face the wind directly.

Second—Jump higher and higher progressively, and try to improve very slowly. Do not begin exercises while the wind is very strong.

Third—When descending to earth, step out with your feet, leaning the body backward and raising the apparatus in front.

Fourth—Take great care in handling apparatus at all times, especially while it is new to you.

RULES PROVE OF NO AVAIL.

Operations were commenced Thursday, April 24, a date which will hereafter occupy a prominent place in the history of aeronautics. Through an accident, a remarkable feat was accomplished. The second of Lilienthal's rules was violated at the outset, as a wind of not less than twenty-five miles an hour was blowing from the northeast. Later on, all of the principles upon which an aeroplane glides through the air were set aside and the experimenters began operations on rules and principles of their own, adopted especially for the occasion.

Mr. Bodine got into the machine and faced the wind, according to Lilienthal's directions, starting from the top of the hill. It was impossible to make any progress. Several efforts were made to jump high in the air, but each time the wind struck the wings with such force as to almost throw machine and operator over backward. It was impossible also to get the apparatus into such a position that it would properly cleave the air.

The experiment was about to be abandoned for the day, when it was suggested that the machine be flown as a kite. A rope was accordingly produced and attached to the front of the apparatus. Mr. Frank Ver Beck, the well-known artist, who was among the spectators, expressed a desire to make the ascension, and he accordingly stepped into the position between the wings temporarily vacated by Mr. Bodine.

Three strong men took hold of the other end of the rope, fifty feet away, and a run at full sped was made down the hill. For about fifteen feet Mr. Ver Beck and the machine clung to the ground. Then, almost as suddenly as a ball leaves a cannon, man and machine shot twenty feet into the air. The rope was torn from the hands of the men with lightning velocity, taking particles of flesh from one hand as it went.

SUCCESS PROVED POSSIBLE.

For several seconds Mr. Ver Beck remained stationary in the air. Then, not exactly knowing what else to do, he came down, not very slowly or yet very gracefully. He landed on his right wing, fracturing a couple of the ribs in it, but escaping injury himself. Had Mr. Ver Beck known how to balance and otherwise manage the machine, he could at the altitude he attained with the assistance of the rope have soared at least 300 yards and landed in perfect safety.

A SECOND EFFORT.

Mr. Bodine began the following day where Mr. Ver Beck left off. The wind was blowing about ten miles, making it easy to handle the machine. Lilienthal's directions were followed minutely and much progress was made. Mr. Bodine found that in running down the hill and jumping high as the inventor suggested he would be carried from ten to fifteen feet at each jump, at a hight of three, four or five feet from the ground. Exercises were continued daily thereafter, the flights gradually increasing in length.

The latest trial was made last Thursday, morning, and thus far it has been most successful. Mr. Bodin e flew, or rather soared, seventy-five yards. The course was due east, the start being made from the top of the hill.

The wind upon this occasion was blowing about thirteen miles an hour. Mr. Bodine ran with the apparatus to the edge of the hill and leaped as high as possible in the air—perhaps three feet. He maintained this height until he had soared about ten feet, when a puff of wind caught the machine just right, raising it about seven feet more. This altitude was held for about fifty of the seventy-five yards covered, when the wings gradually sank nearer the earth. A landing was made gracefully and without injury to the machine or to Mr. Bodine.

The latter is infatuated with the sport and declares that every athlete would be charmed with it after the first successful trial. He says that it is almost impossible to describe the sensation of floating rapidly and safely through the air. The only thing he can compare to it, he declares, is a particularly pleasant dream he once had, in which he imagined he was being carried gently to the clouds by some unseen force.

HOW FLIGHT INSPIRES AMBITION.

"After leaving the ground," he says, "the first thing you feel is a peculiar sensation in the pit of the stomach—a sensation of lightness—but that passes away in a moment and is succeeded by a desire to get higher and higher in the air. There is an overwhelming ambition to reach the clouds. Strangely enough, too, after you leave the earth there is not the least bit of fear. The only thing you think of is to try to keep afloat as long as you can. No one can realize how substantial the air is until he feels its supporting power beneath him. It inspires confidence at once.

"I have found that it is necessary to be able to instantly transfer the centre of gravity, so far to the rear as to overcome the action of the air, which might otherwise tend to throw me forward and precipitate me to the earth. When one feels himself falling, the natural impulse is to stretch out the arms and legs in the direction of the fall, but it is one of the peculiarities of this mode of navigation that the movement must be in the contrary direction or toward the upper side. The centre of gravity is thus shifted to the one side or to the other, forward or backward, and the pressure of the air acting with greater force on the lighter and broader surface soon restores the equilibrium. It is not easy to realize in practice at first, but after a short experience the movement becomes almost involuntary.

NOT A DANGEROUS SPORT.

"So far as I can pudge, there is practically no danger. In case of a fall the worst that can happen is the breaking of the machine. I think that flying is an ideal sport, and that it is bound to become popular among athletes. It affords every chance for a magnificent contest and a display of brain and muscle."

Others who are competent to judge, and who have witnessed the experiments, think that flying is a sport that has come to stay.

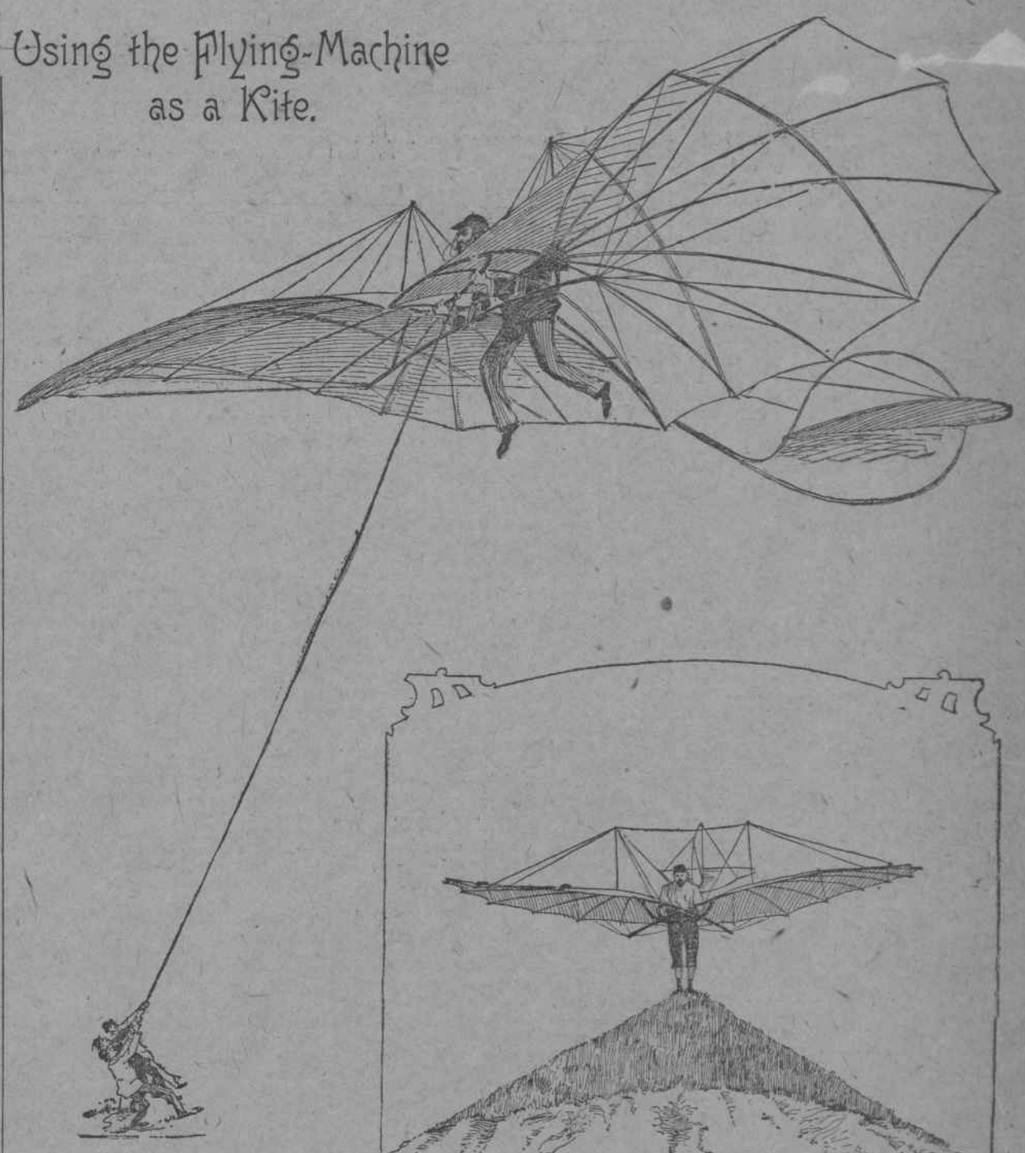
Mr. W. A. Eddy, who does all sorts of things with kites, except build one that will life a man, has examined the Journal's machine, and pronounces it a marvel. He was enthusiastic over the power it displayed in hoisting Mr. Ver Beck.

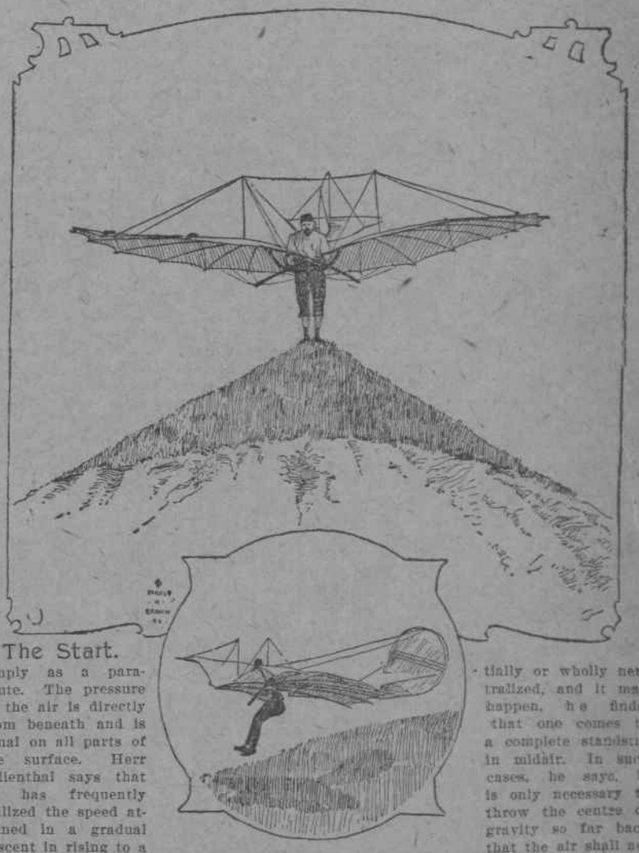
WITH AND WITHOUT WIND.

When there is no wind the apparatus acts simply as a parachute. The pressure of the air is directly from beneath and is equal on all parts of the surface. Herr Lilienthal says that he has frequently utilized the speed attained in a gradual descent in rising to a greater height in order to soar over some obstacle like a tree or a crowd of people. Under favorable circumstances, he says, it is easy to mount to a height even greater than that of the starting point, but the forward motion is thereby partially or wholly neutralized, and it may happen, he finds, that one comes to a complete standstill in midair. In such cases, he says, it is only necessary to throw the centre of gravity so far back that the air shall act more powerfully on the forward surface, and the gradual gliding descent is resumed.

In the near future the Journal will extend invitations to representatives of the various athletic clubs to witness the trials.

Using the Flying-Machine as a Kite.





The Start.

The Landing.